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Title: Circumpolar observations of ice wedge melting and thermokarst pool expansion

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Circumpolar observations of ice wedge melting and thermokarst pool expansion

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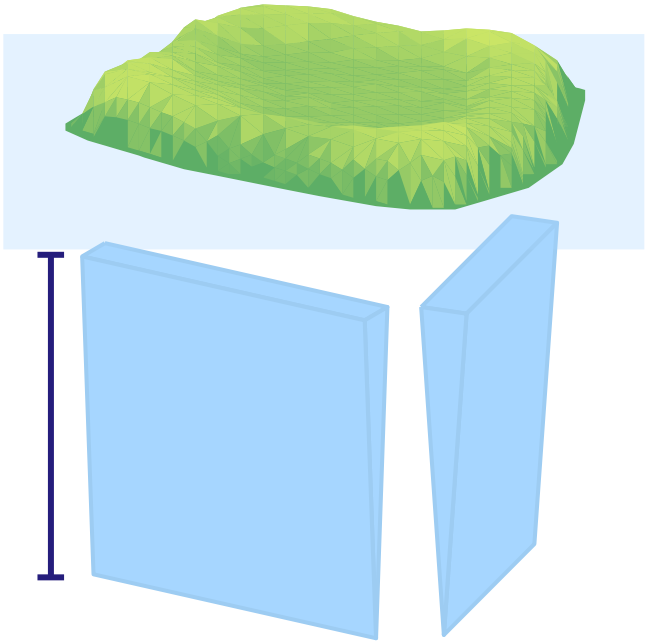
February 22, 2021

Ice wedges

Erika Podest, NASA Jet Propulsion Laboratory

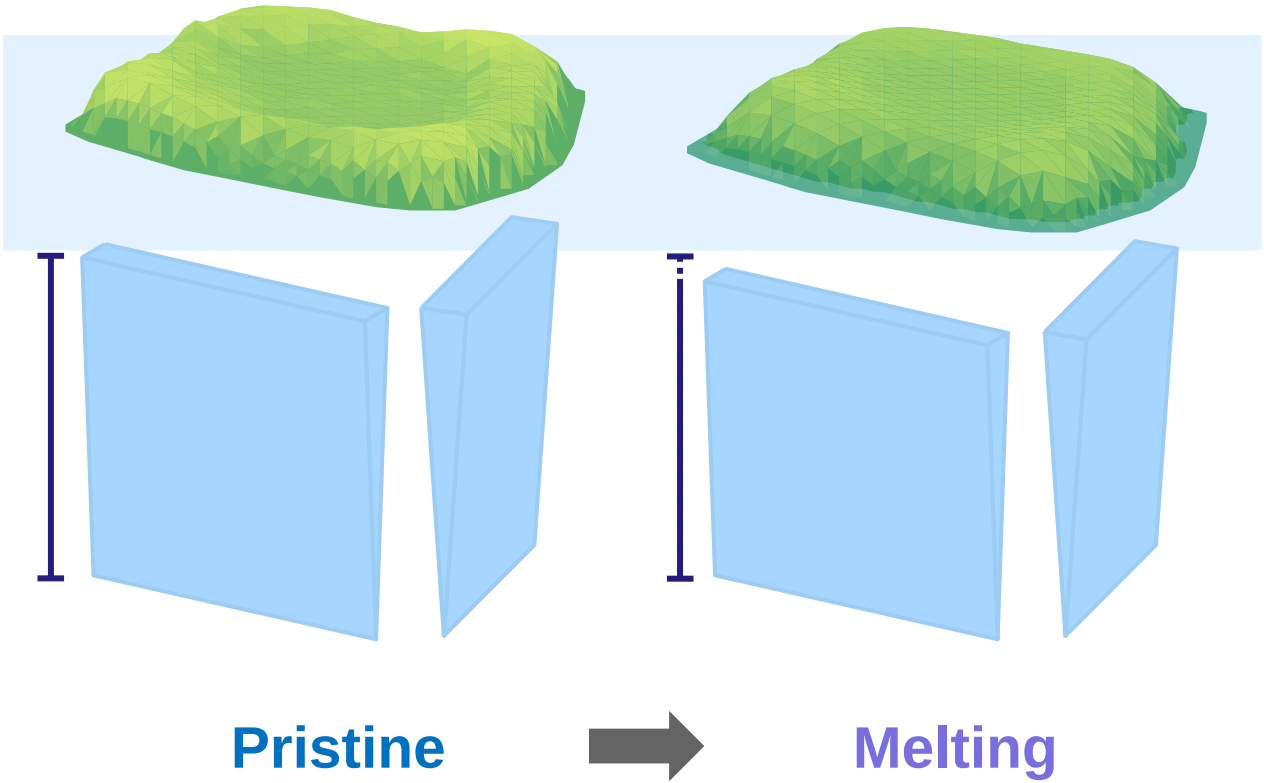
www.page21.eu/gallery/field-stations-2012

Ice wedges and thermokarst

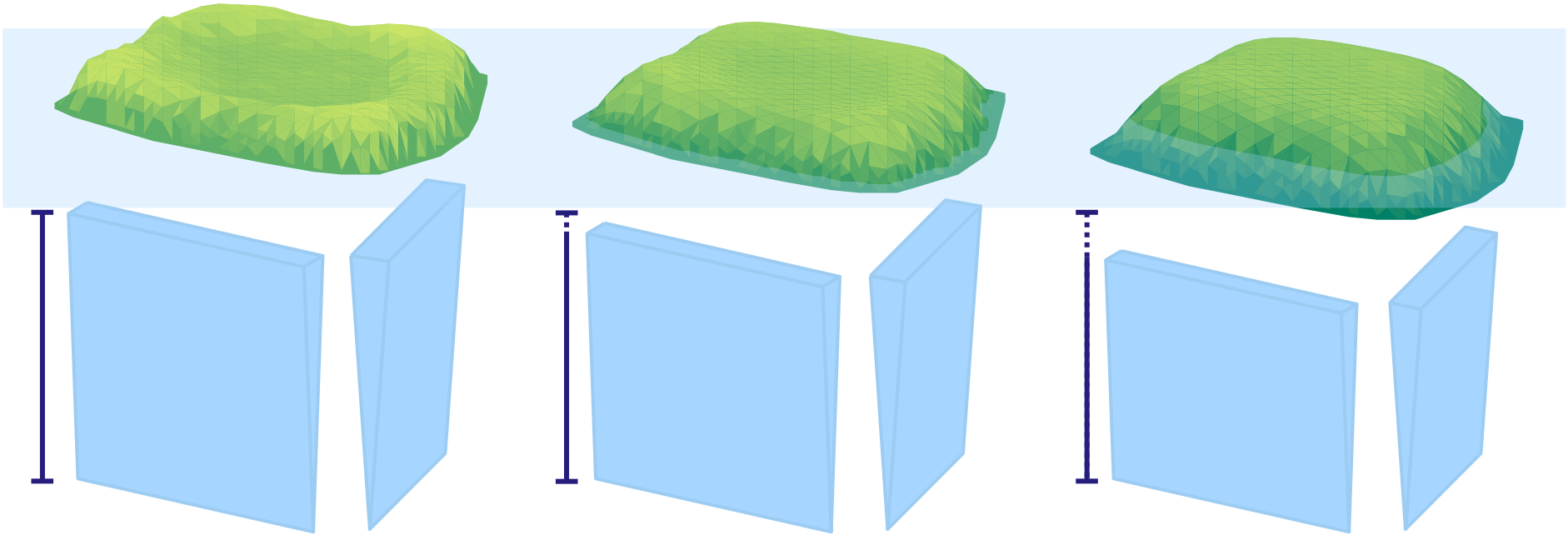


Pristine

Ice wedges and thermokarst



Ice wedges and thermokarst



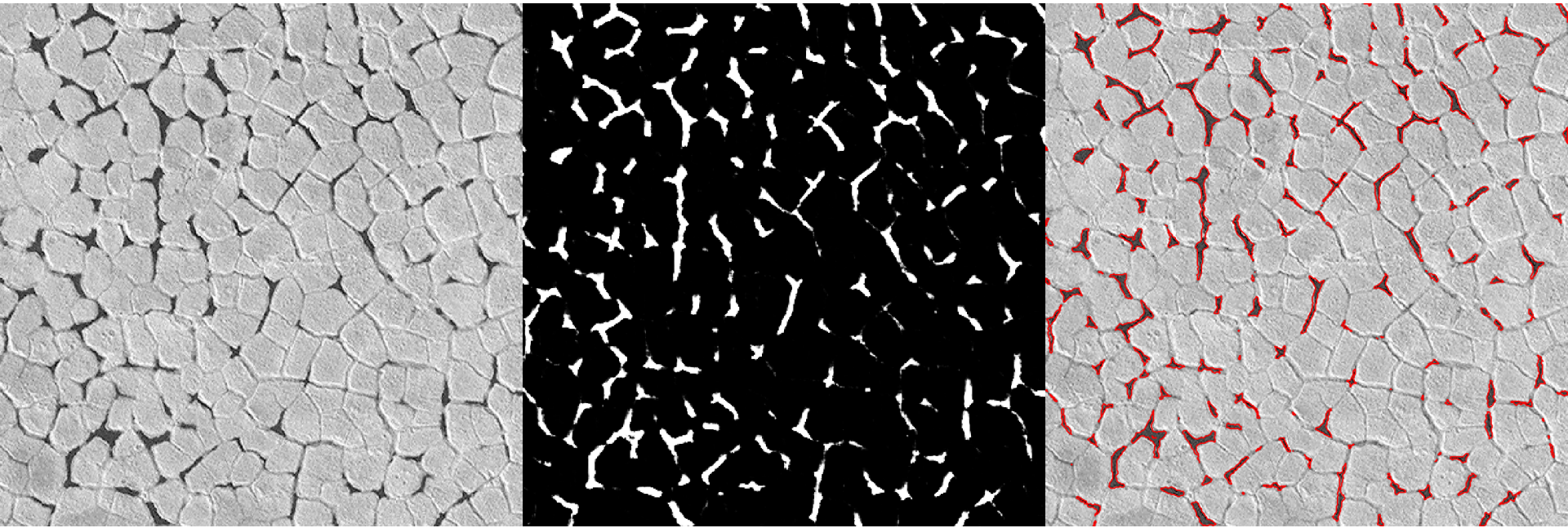
Ice wedges and thermokarst

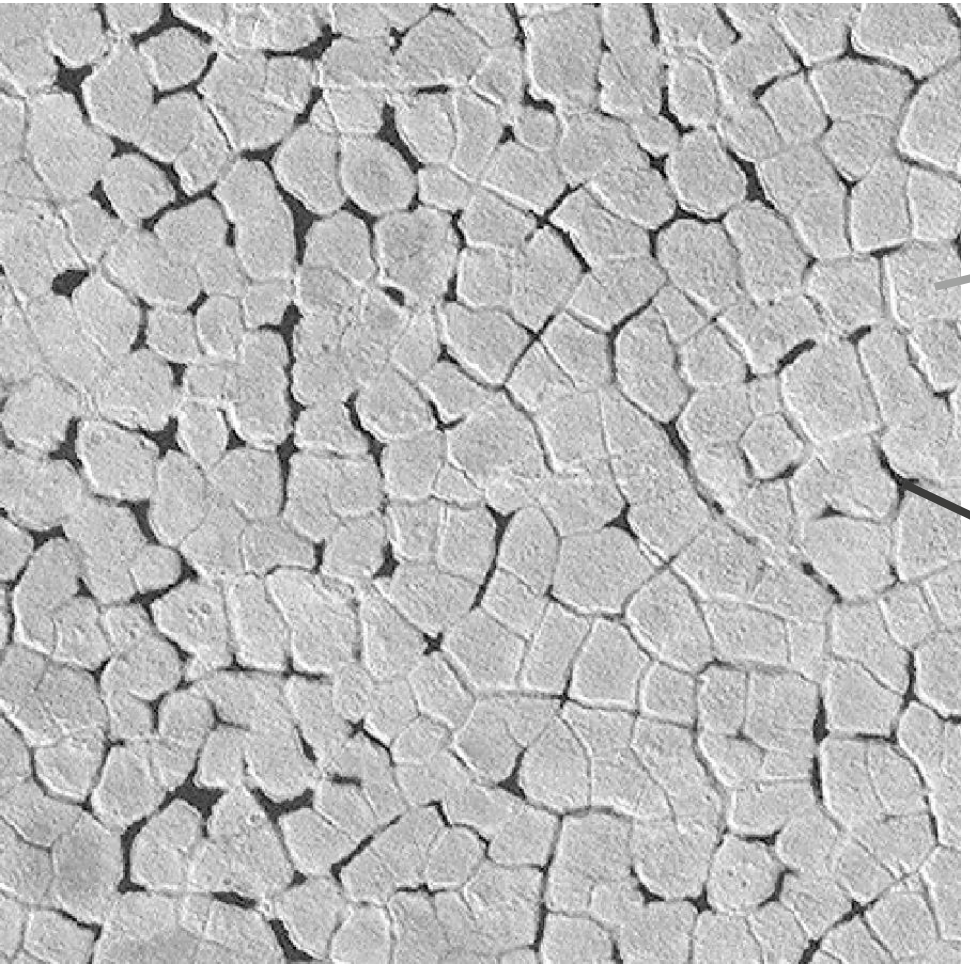
Workflow for outlining thermokarst pools

Panchromatic WorldView Data

Output of CNN

Output of CRF

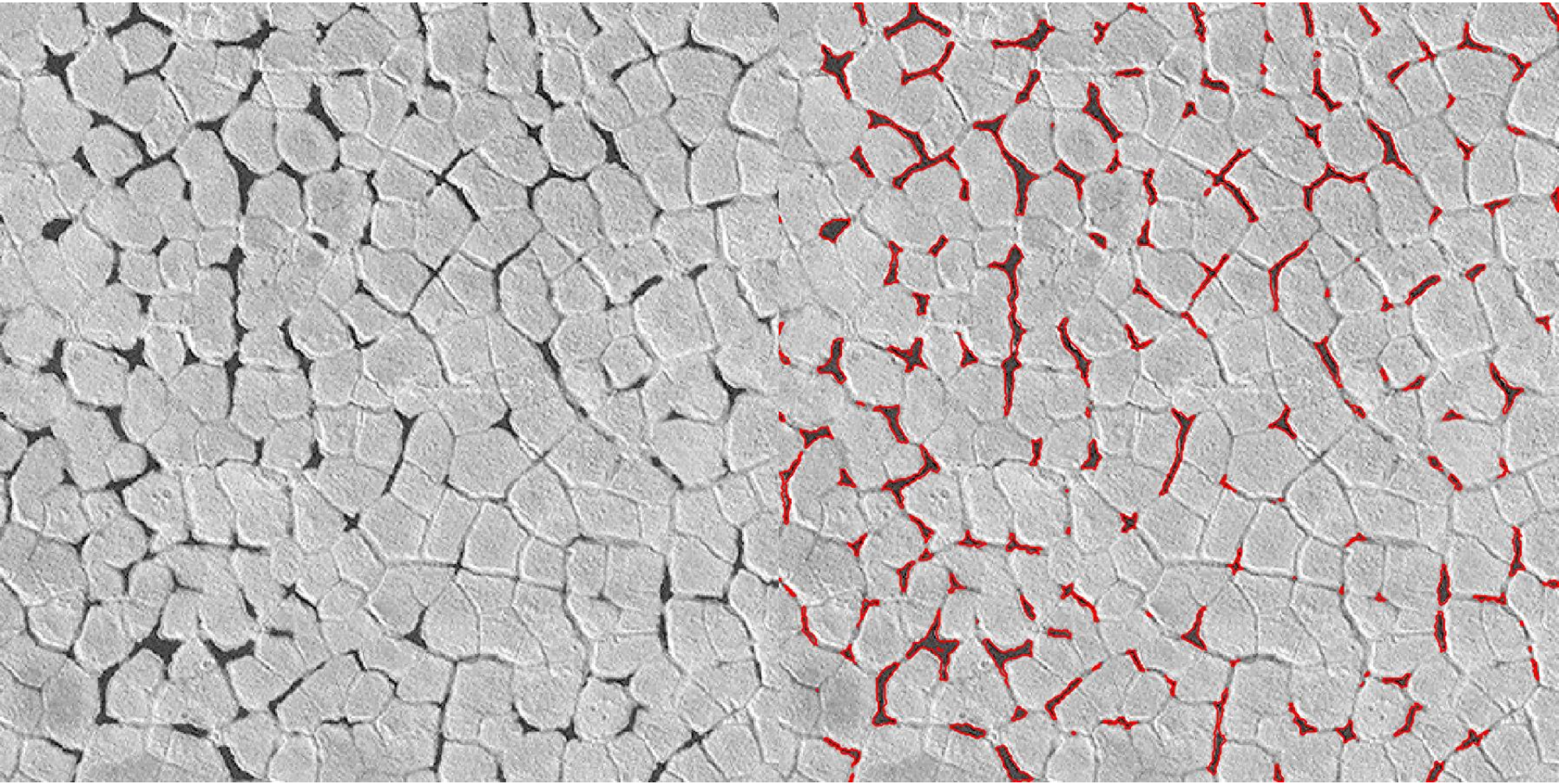


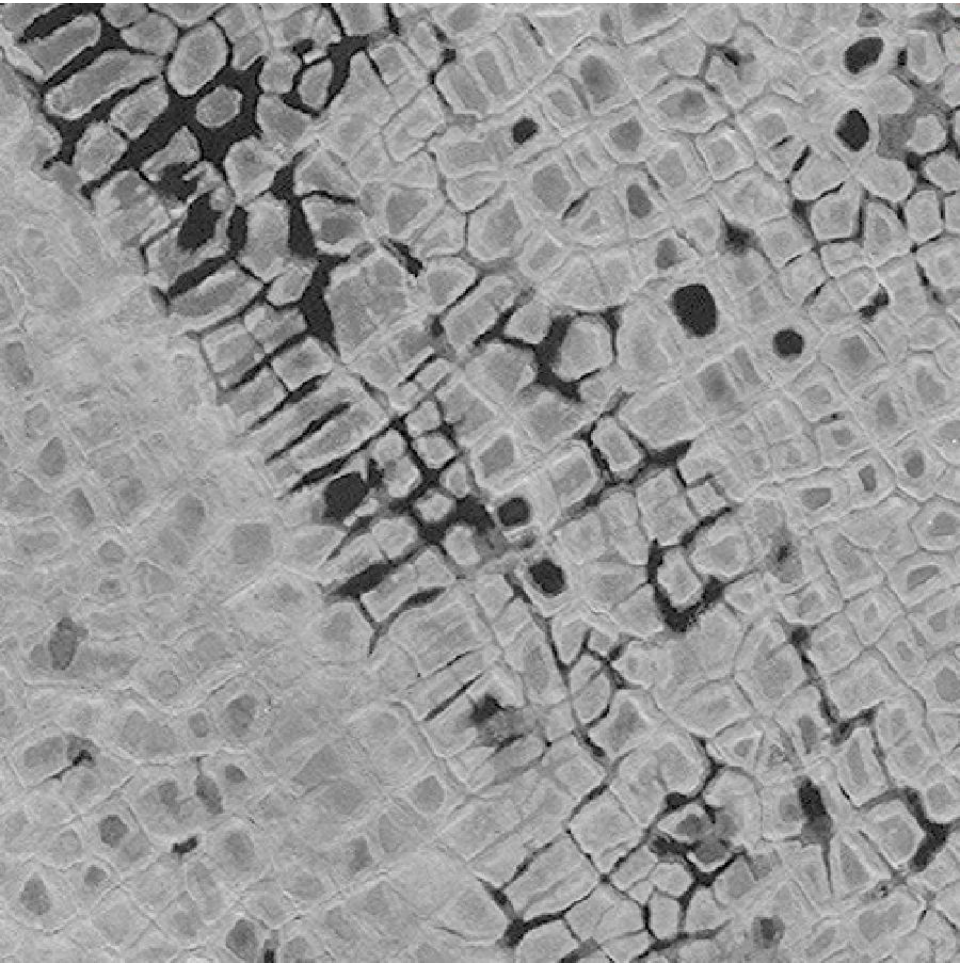


Bare tundra

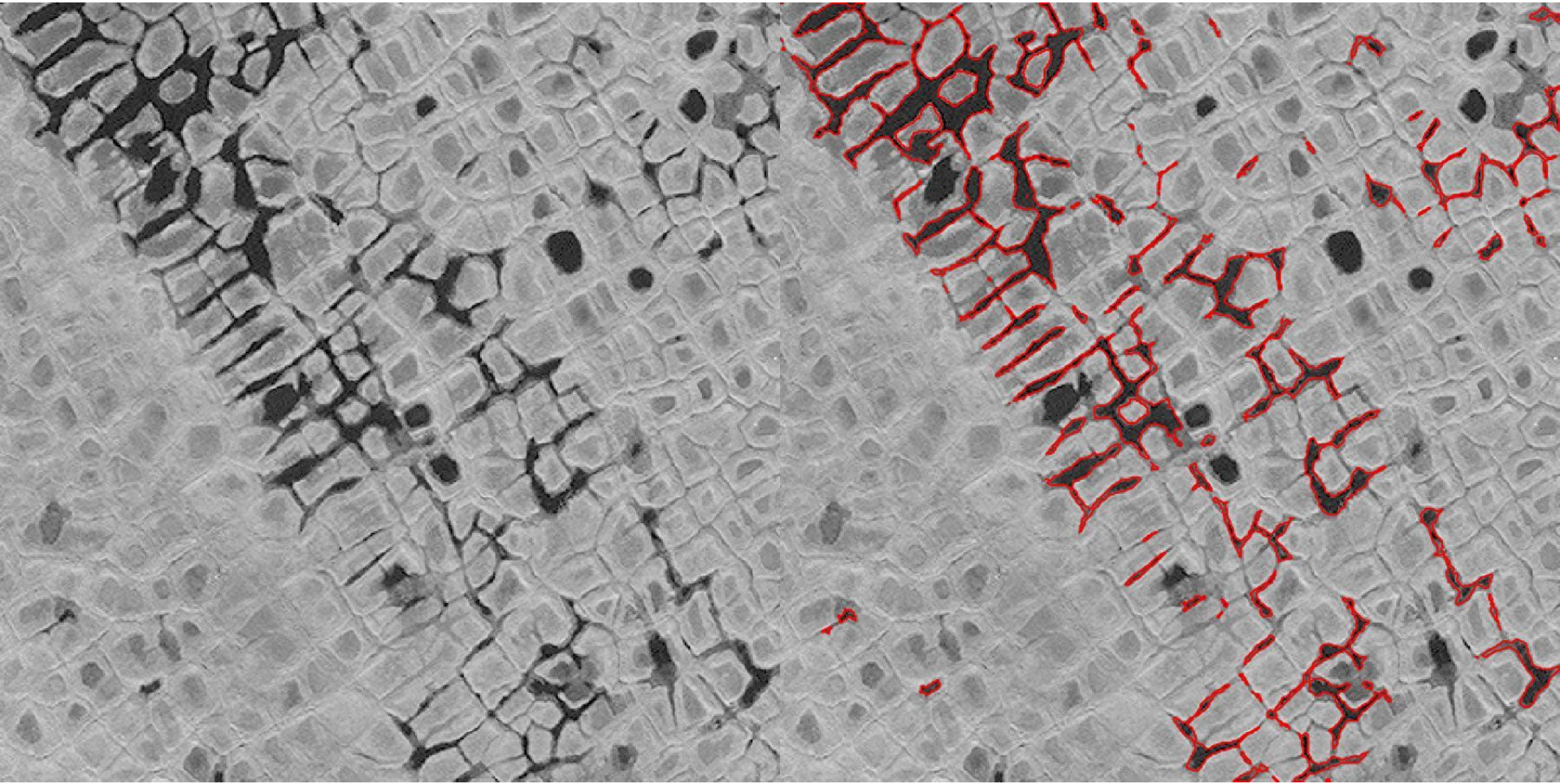
Thermokarst pool

50 m

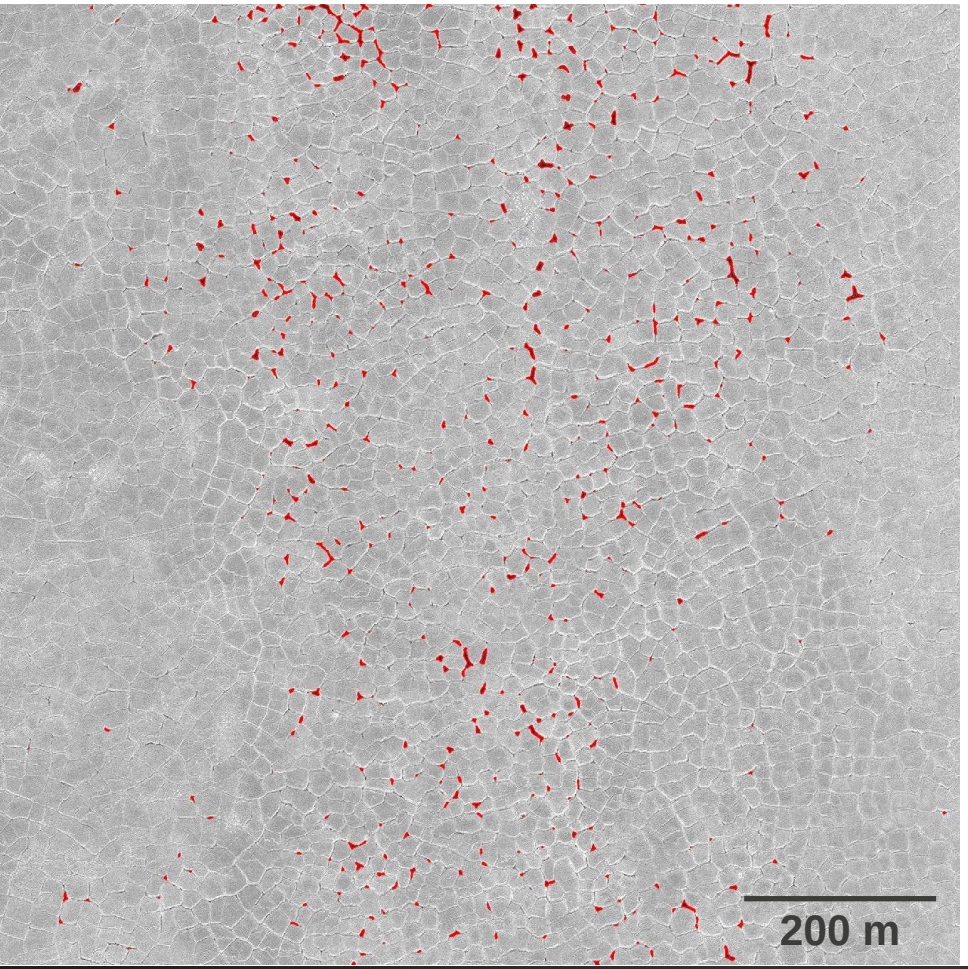

50 m



50 m


50 m

2008-07-12



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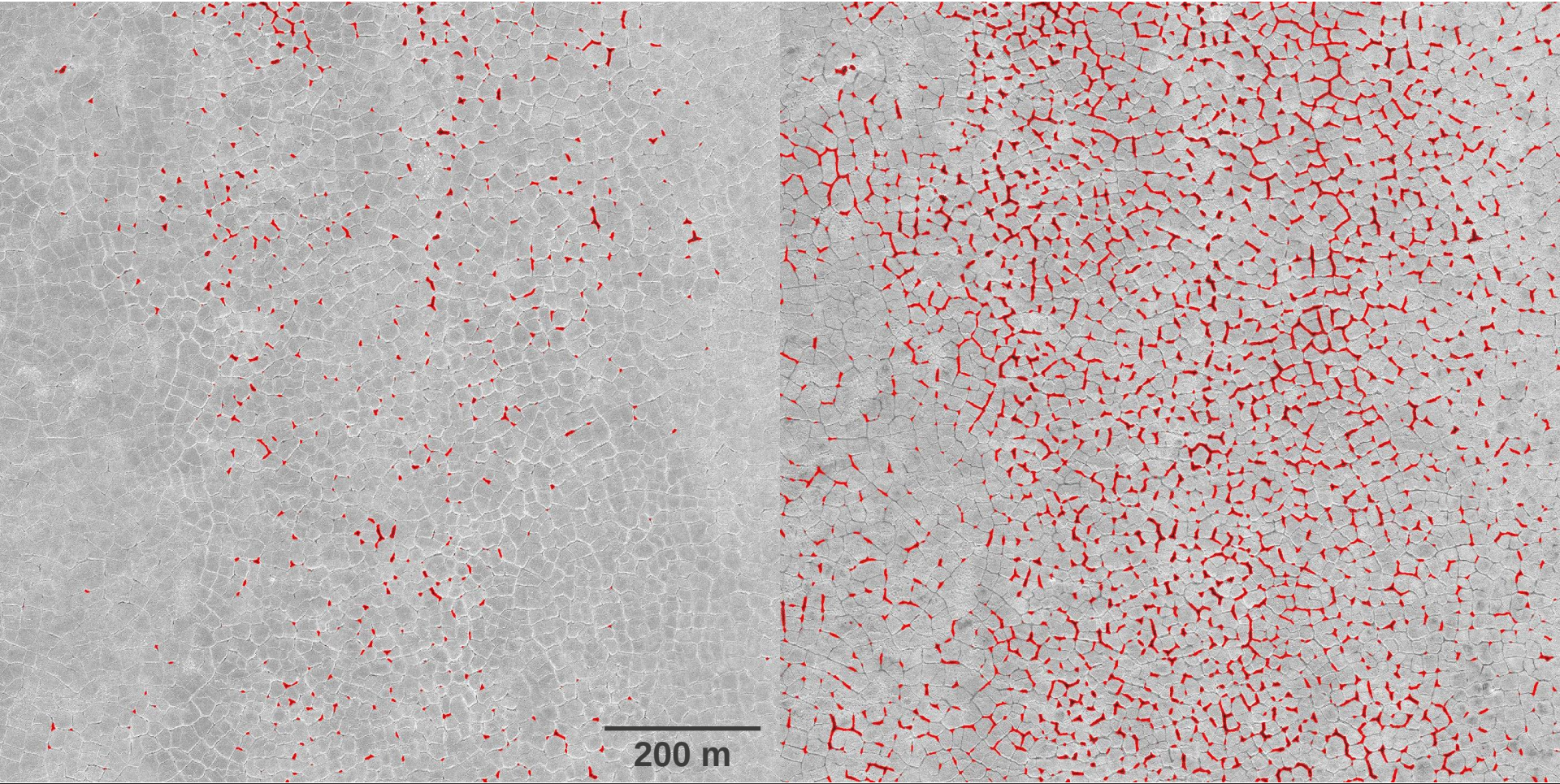
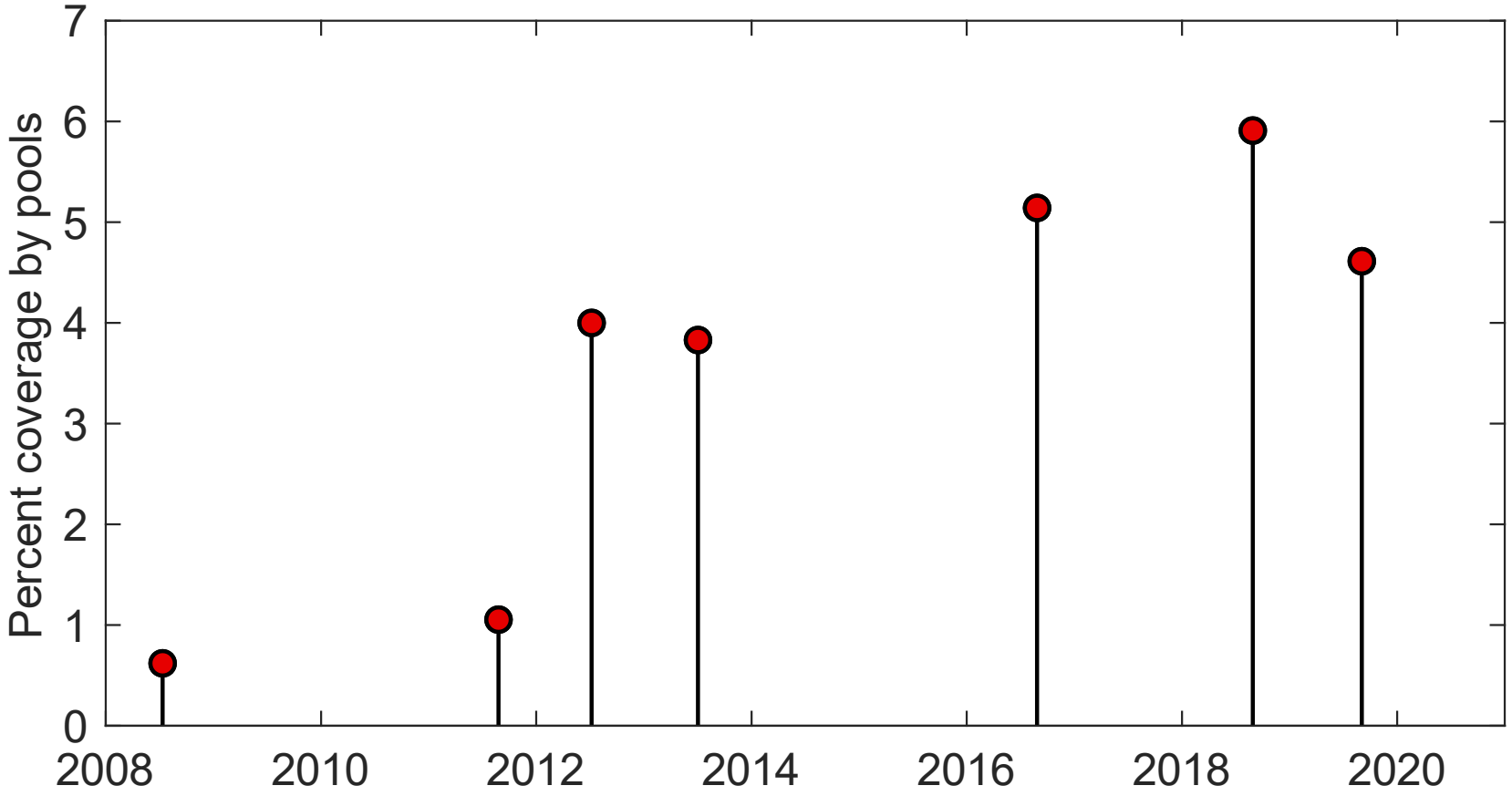


Inundation at Prudhoe Bay, Alaska



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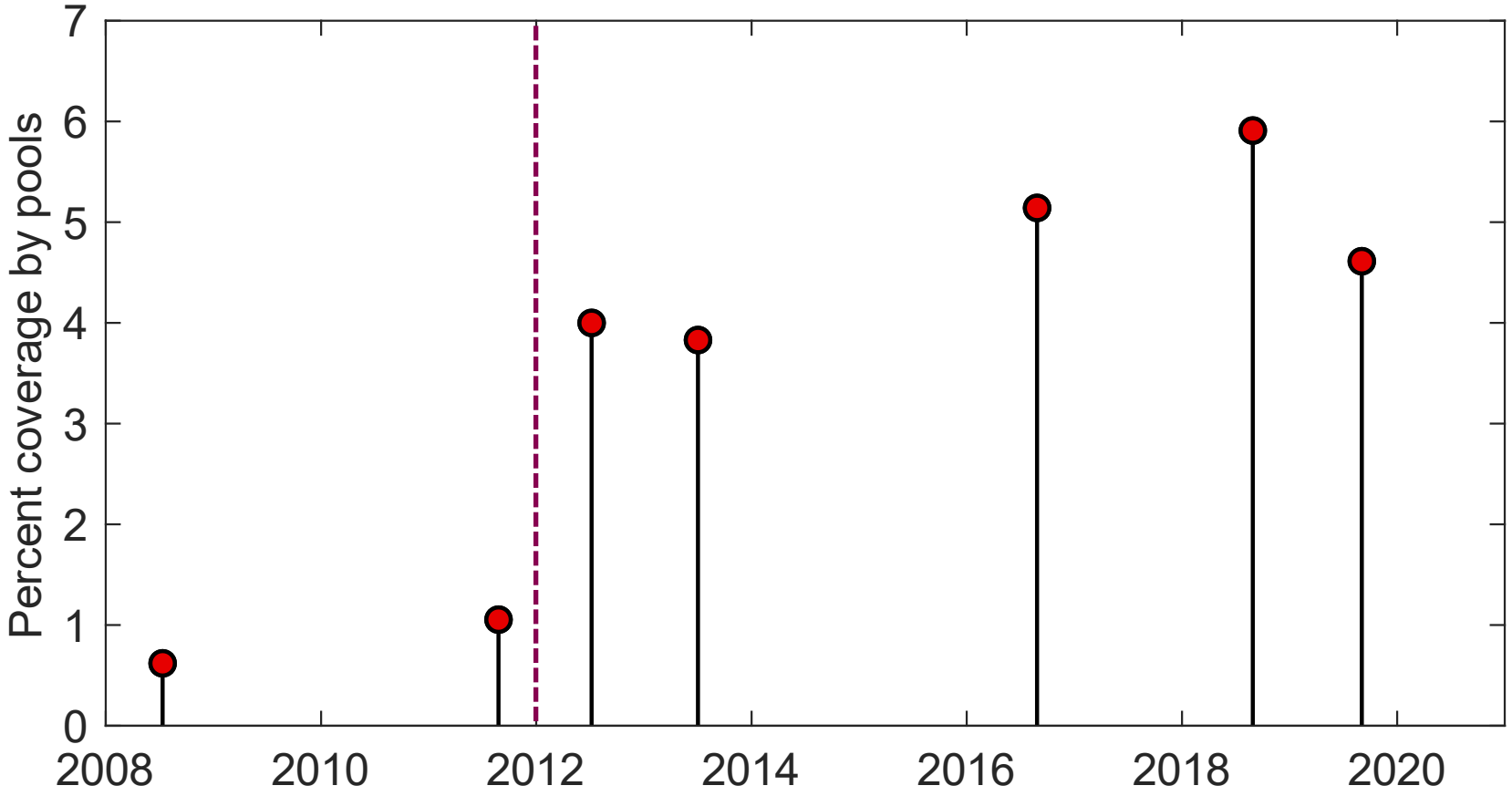
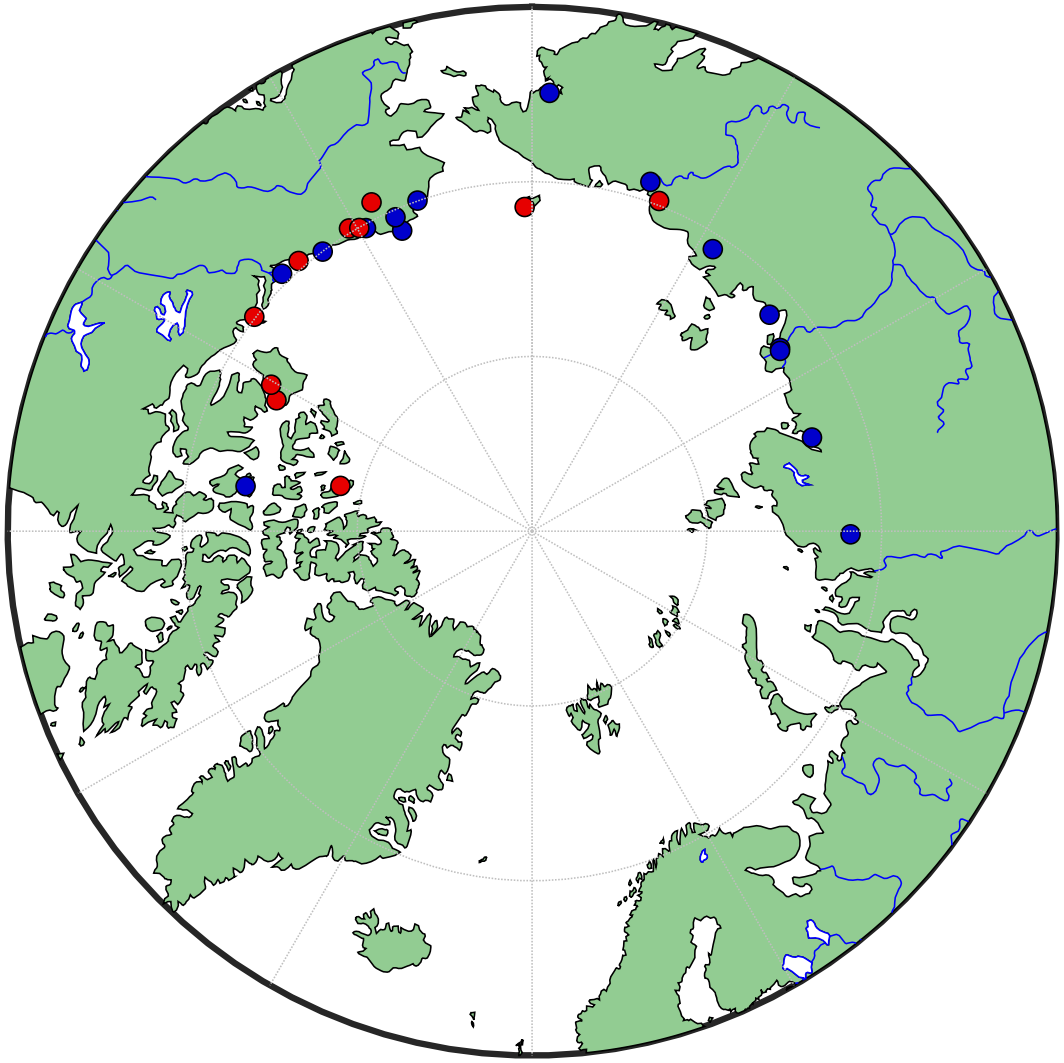
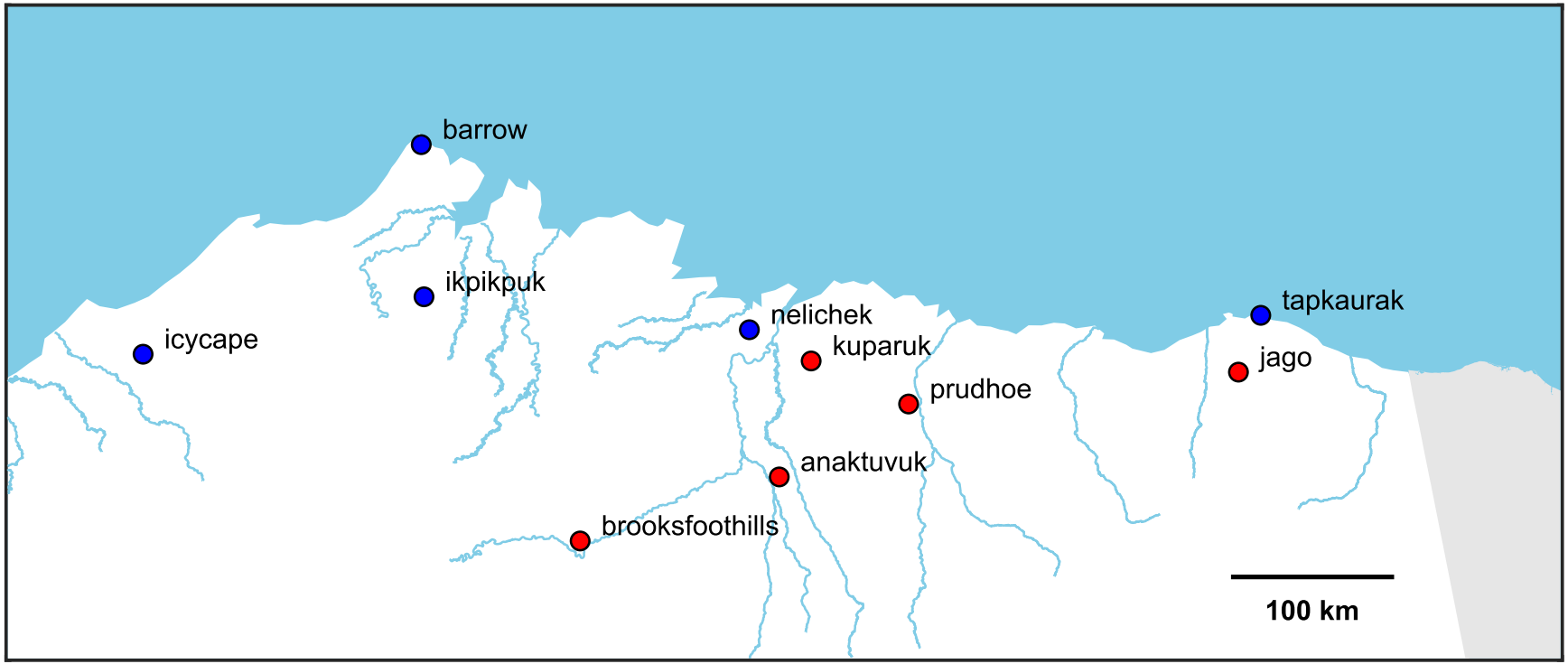


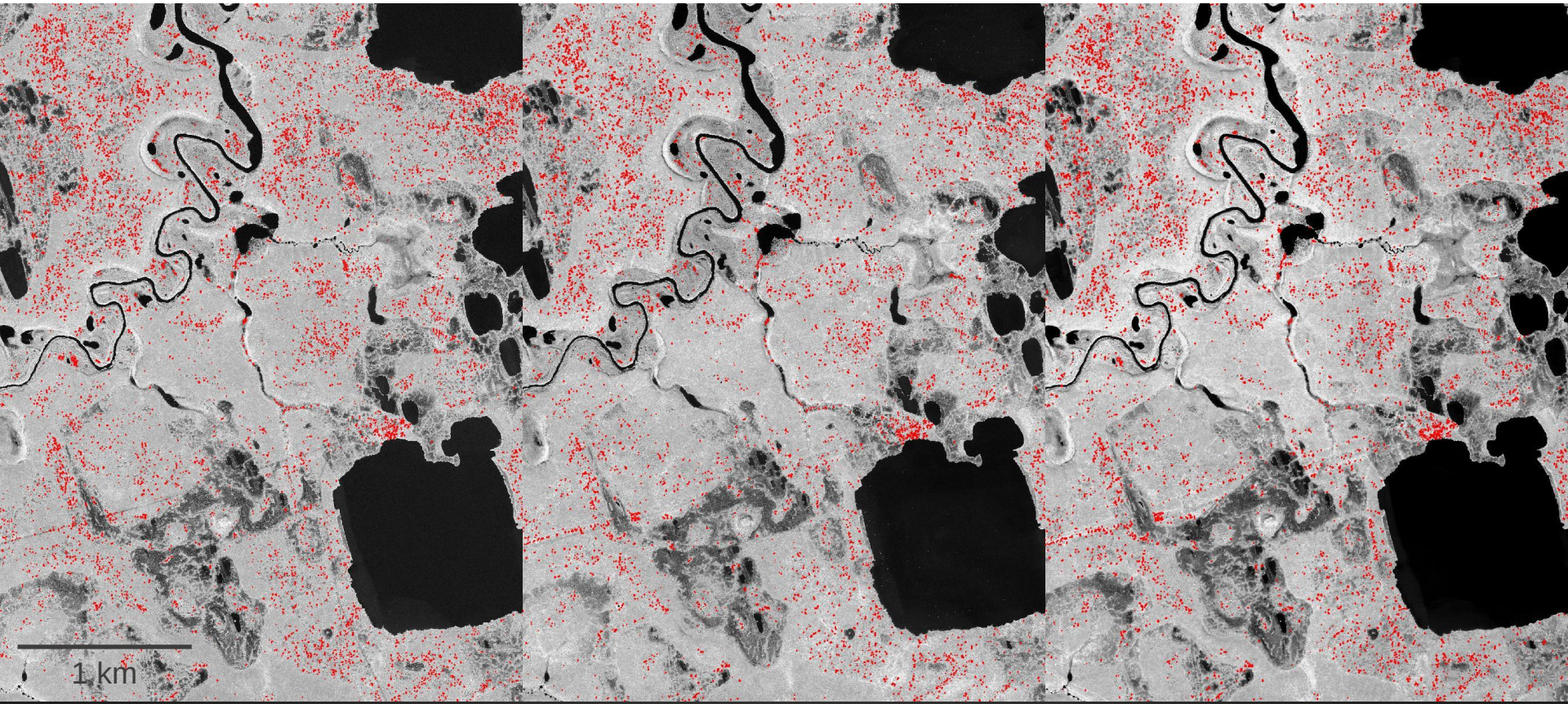


Alaska North Slope

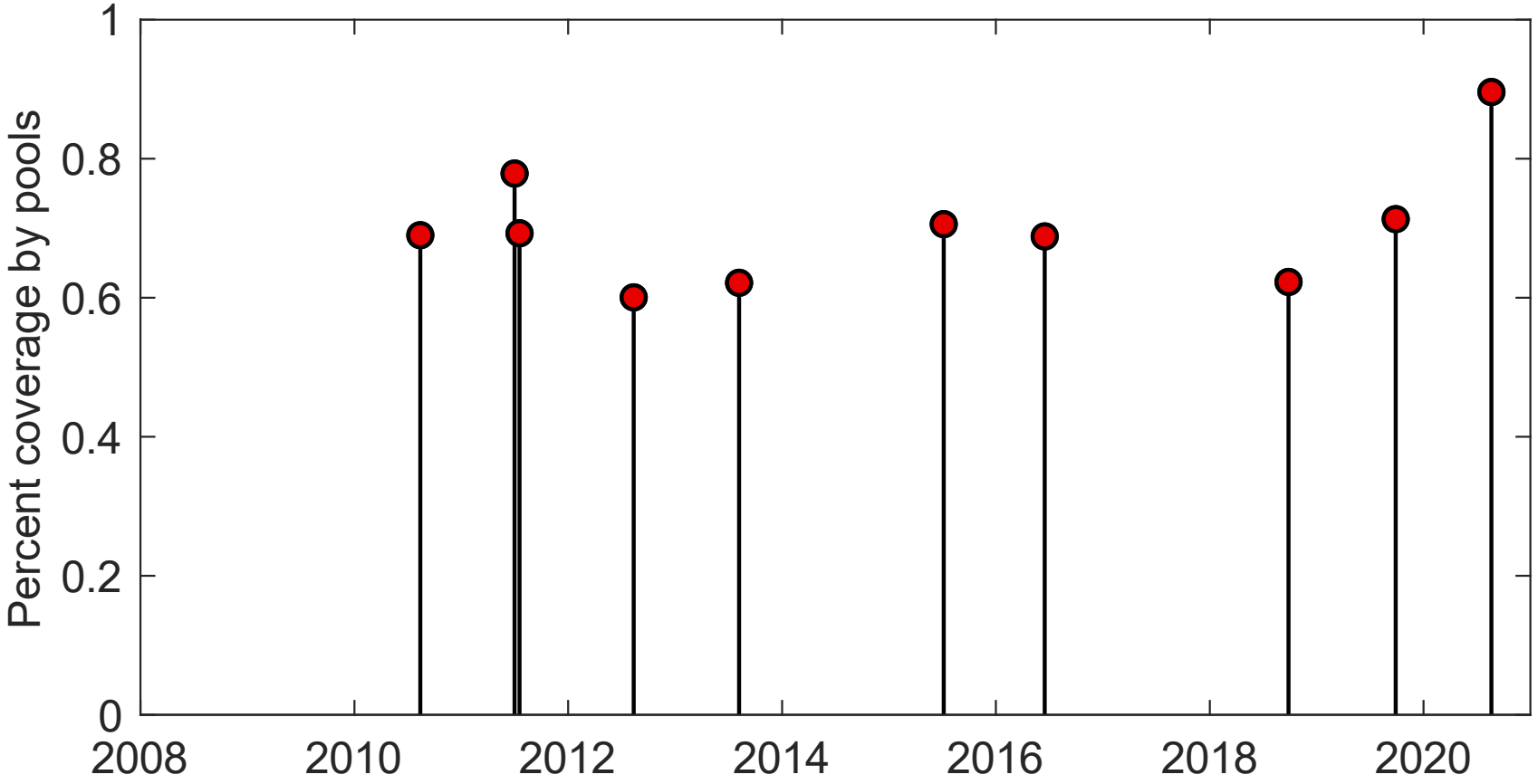


Colville River Basin, Alaska

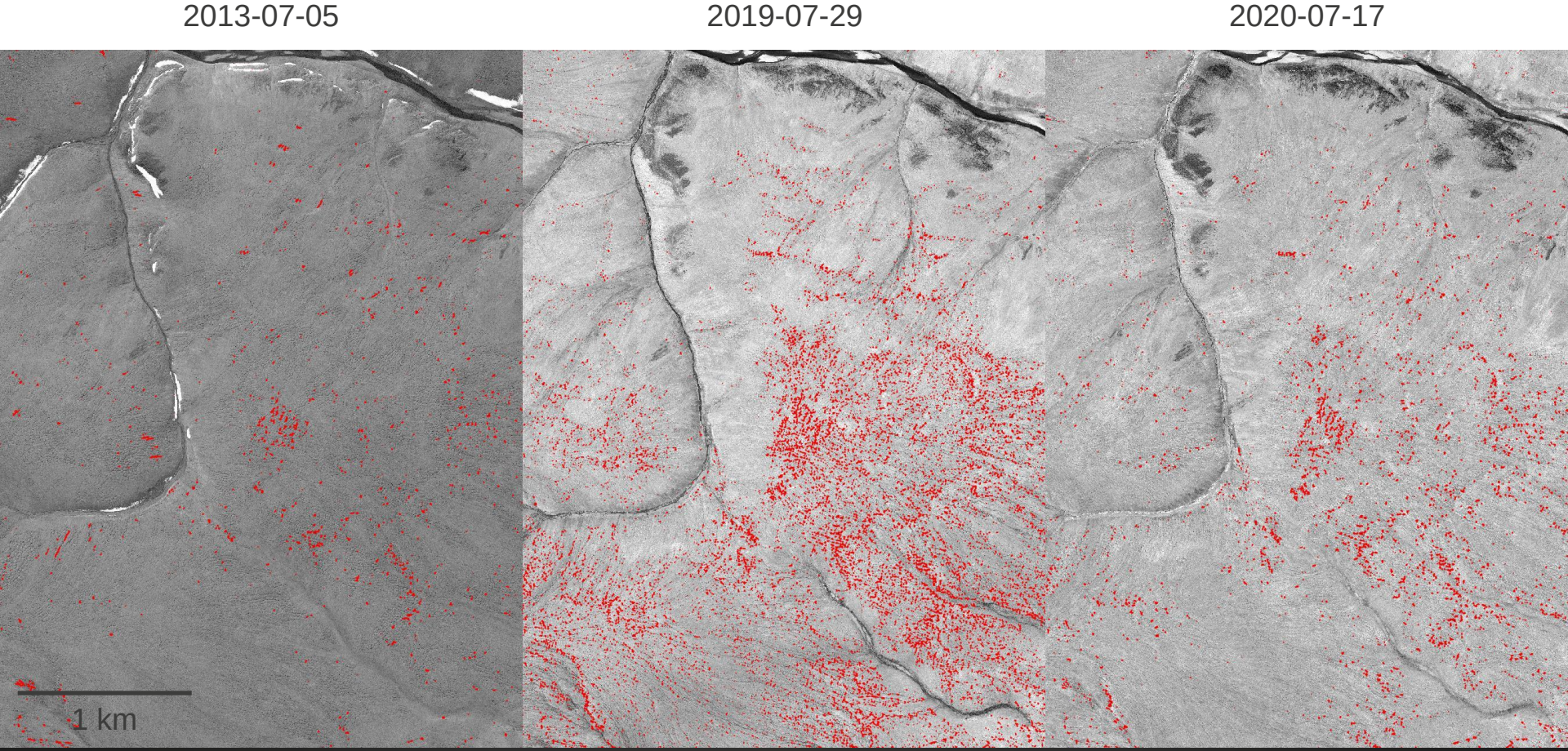
2010-08-14 2015-07-07 2020-08-20



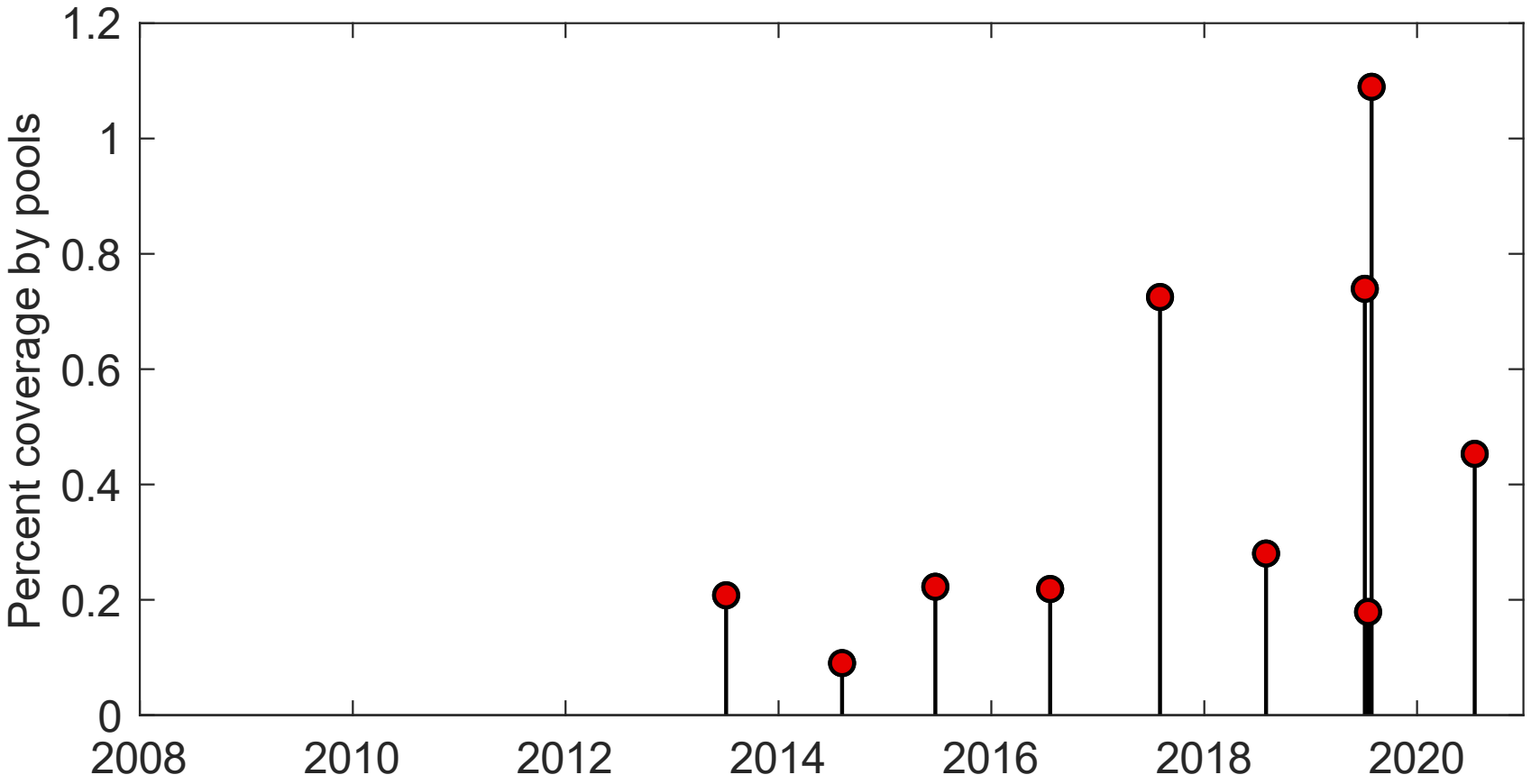
Colville River Basin, Alaska



Wrangel Island, Siberia



Wrangel Island, Siberia



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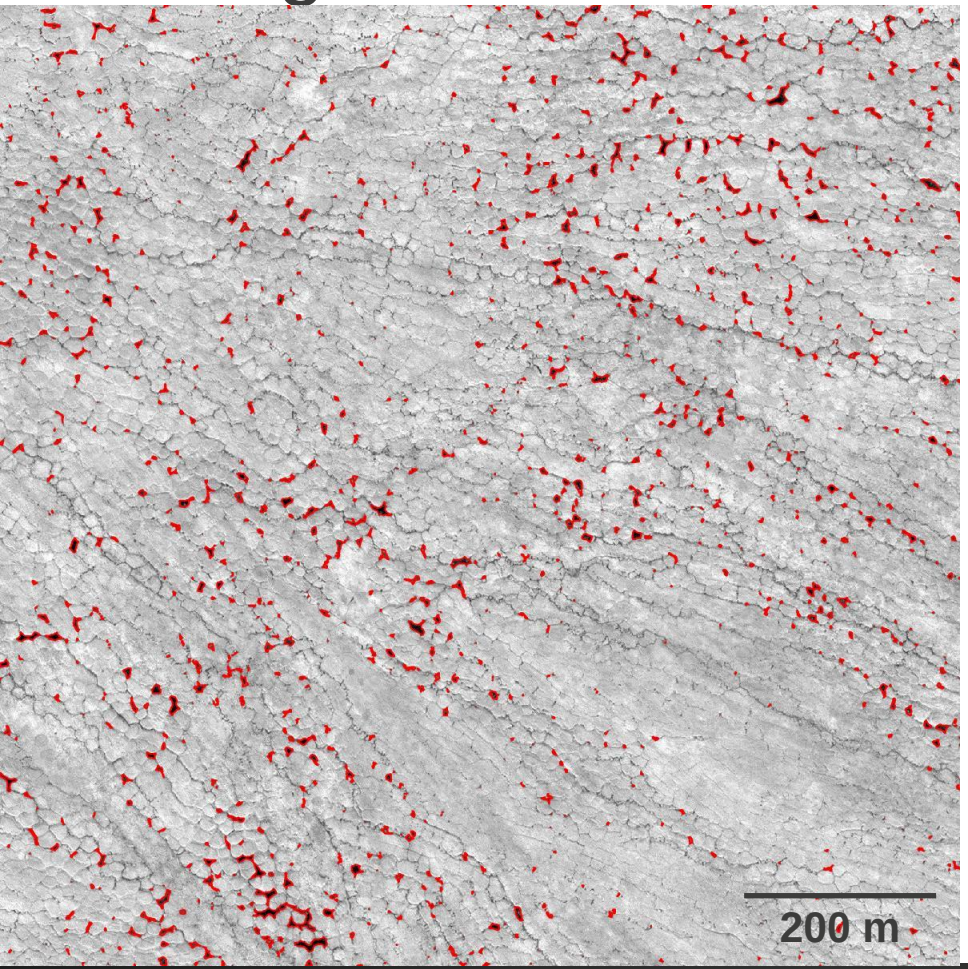
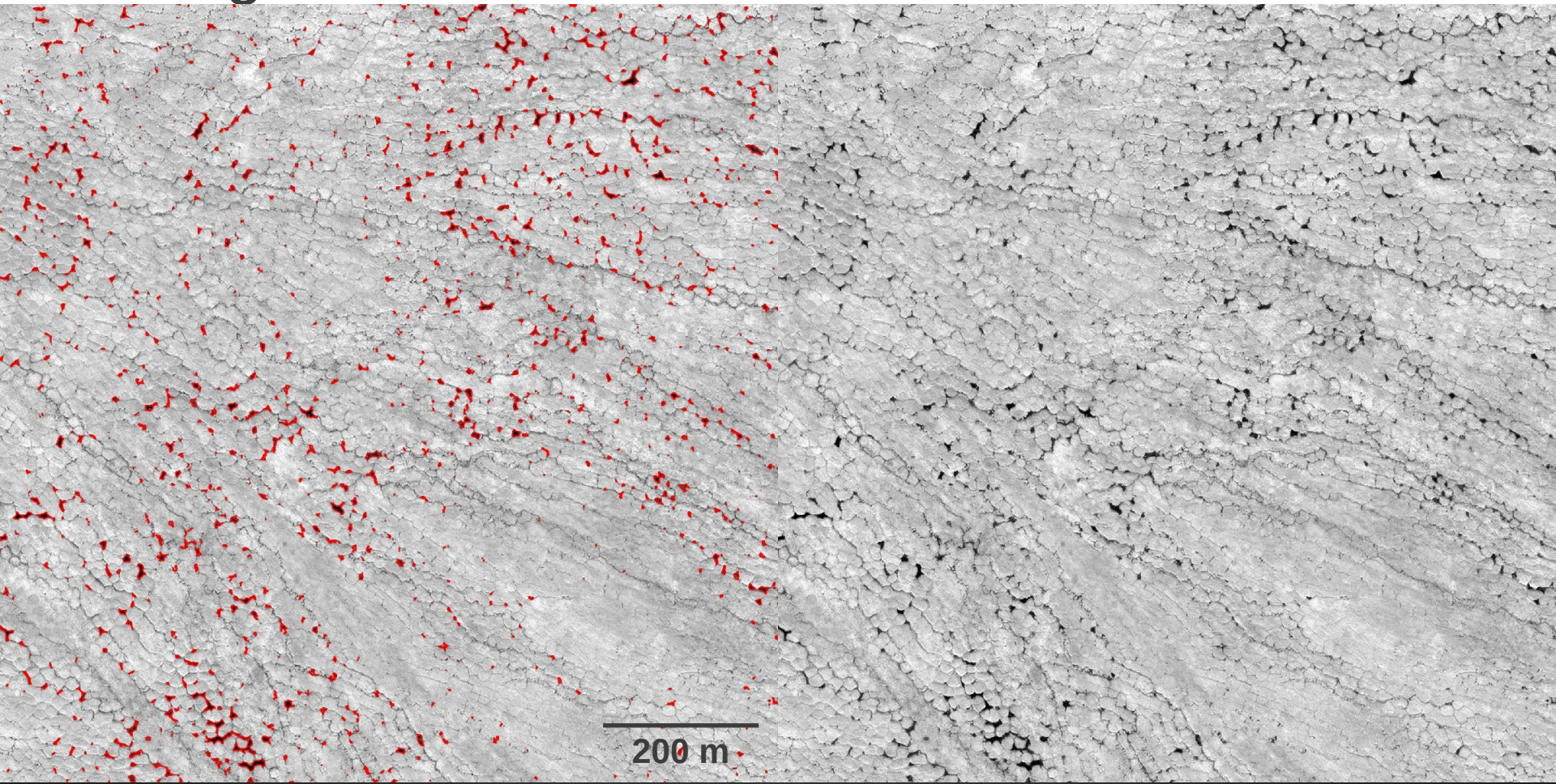
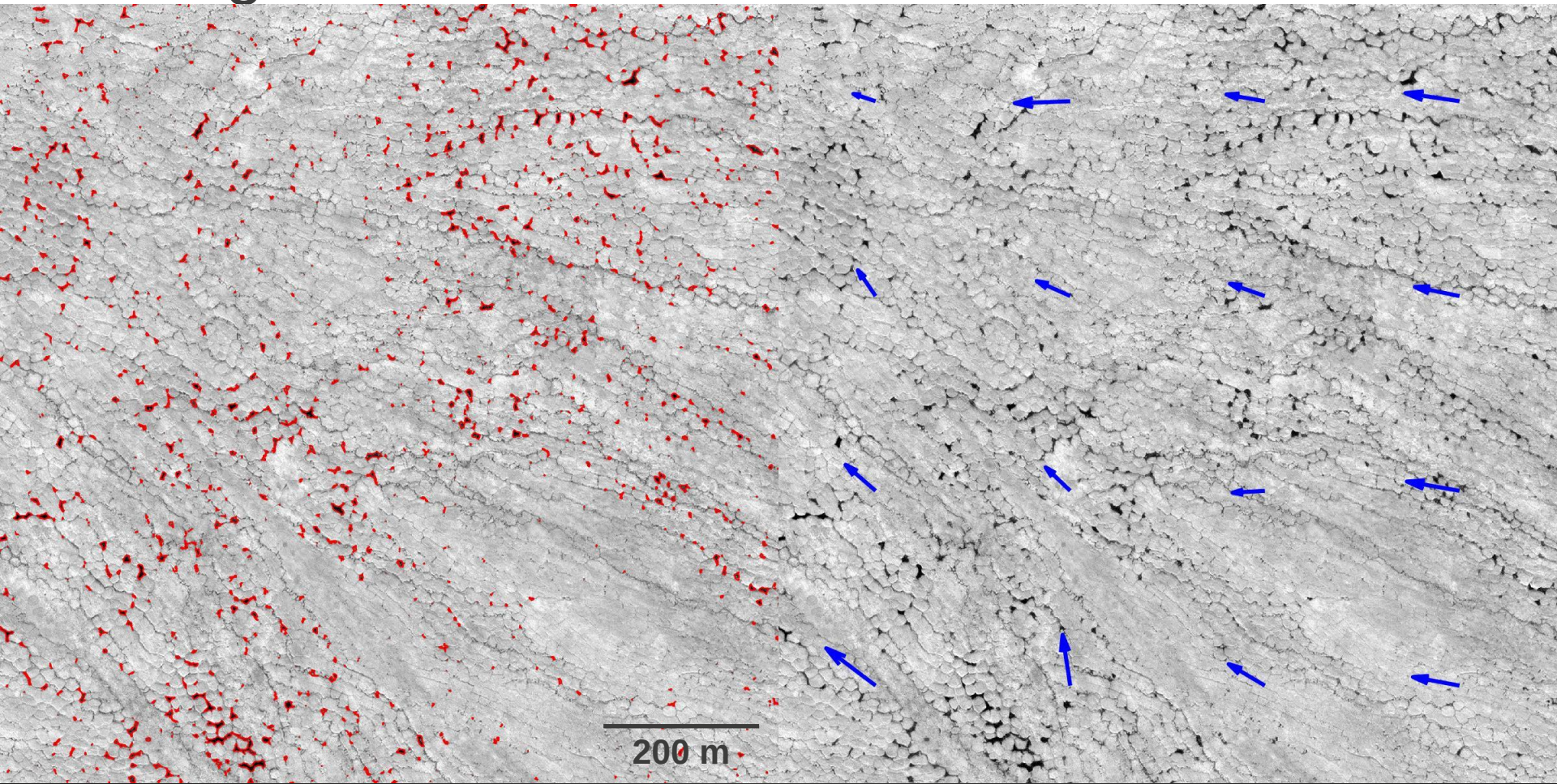


Wrangel Island, Siberia



Wrangel Island, Siberia



Conclusions

- Recent thermokarst pool expansion is highly heterogeneous at regional to pan-Arctic spatial scales.

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Conclusions

- Recent thermokarst pool expansion is highly heterogeneous at regional to pan-Arctic spatial scales.
- Abrupt thermokarst pool expansion often coincides with exceptionally warm summers.
- Thermokarst pool stability at some sites may be attributable to negative ecological feedbacks.
- Lateral drainage is an important component of the water budget in some thermokarst pools in hilly terrain.

Thank you!

LDRD
innovation for our nation